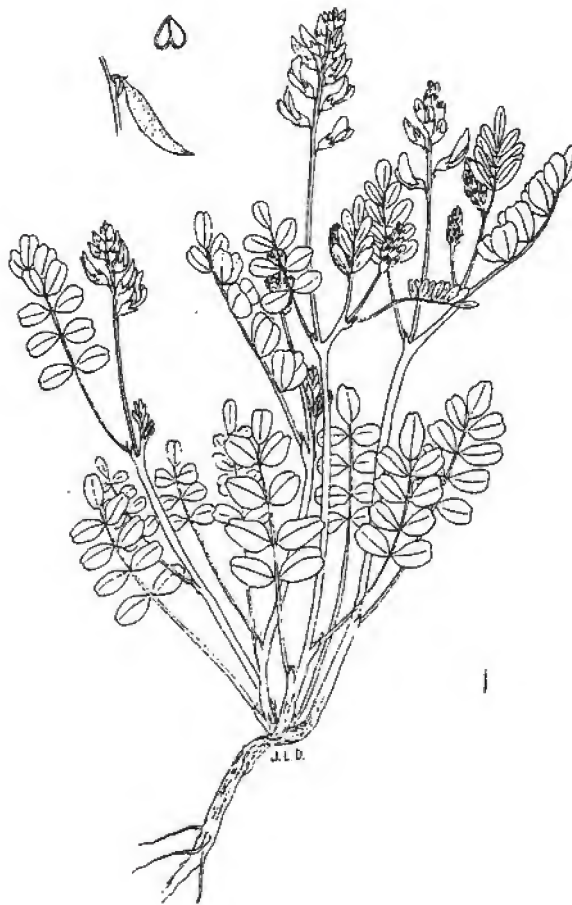


Wyoming Native Plant Society

Vol. 13 # 2
May 1994



Why Save Rare Plants?

By Robert Dorn and Tim W. Clark

Above: Payson's milkvetch (*Astragalus paysonii*), a regional endemic of the mountains of western Wyoming and north-central and eastern Idaho. This rare plant occurs naturally on disturbed sites created by forest fires and blow-downs. Today, it is found primarily on recovering clear-cuts and road cuts. The species shows excellent potential for use in reseeding disturbed lands (with the added bonus of being a Nitrogen fixer). Ill. by Jane Dorn.

It is estimated that by the year 2000 we will be losing throughout the world about one species per hour to human caused extinction! And between now and then, if trends are not reversed, 500,000 to 1,000,000 species will become extinct (Eckholm 1978). This is many more than those that became extinct in the previous million years. This huge number translates into a loss of global biological diversity of at least one-sixth.

Such a massive loss would constitute a basic and irreversible alteration in the biosphere. Hutchinson (1978) expressed the fear that long before we have reached even an elementary knowledge of the distribution of the kinds of ecological phenomena, they may disappear owing to the con-

tinual erosion of nature that is characteristic of our era. Aldo Leopold (1966) stated the problem more bluntly: "The last word in ignorance is the man who says of an animal or plant: 'what good is it?' If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering." The consequence of our failure to prevent extinctions is clear: "biological impoverishment and human impoverishment are inextricably intertwined" (Eckholm 1978).

continued on page 4

WNPS NEWS

Elections: Nominees for Society officers are: President -Barbara Amidon (Rock Springs), Vice President - Mary Neighbors (Laramie), Secretary/Treasurer - Walt Fertig (Laramie), Board Member - Diana Osuna (Kelly). Jennifer Whipple (Yellowstone NP) is the carry-over Board Member. Additional write-in candidates are welcome.

Scholarship Winner: The Board received six outstanding applications for the annual scholarship (a new record!). At its March meeting, the Board voted to award one scholarship of \$300 to Sandy Floyd, a Master's candidate from the University of Colorado. Sandy is completing a three year study of the Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*), a US Fish and Wildlife Service candidate Threatened species restricted to southeastern Wyoming and adjacent Colorado and Nebraska. Her research on F. E. Warren Air Force Base is addressing population size and demographic questions that are critical for the development of a management plan for the species. We look forward to learning more about Sandy's results in a future issue of the newsletter.

Name Contest: Twelve nominations were received for the "Name the Newsletter Contest". Of these, the Board selected five finalists at its annual meeting. Members are asked to vote for their favorite among the following nominees on the enclosed ballot/renewal form: 1) *Artemisia*, 2) *Bouteloua*, 3) *Castilleja*, 4) Wyoming Native Plant Society Newsletter (for those opposed to change) & 5) *Yermo*.

Proposed Amendments to the Society By-Laws: At the March Board meeting, a recommendation was made to increase the basic membership rate from the current rate of \$3.00 to \$5.00 annually. In addition, the initial membership rate of \$7.00 would be abolished, as would other membership categories (senior & student rates). This increase is being sought to cover anticipated increases in the cost of First Class postage and to allow the Society to increase the number of newsletters from 3 to 4 each year. It was also proposed to amend the By-laws to allow the date of the annual meeting to be determined by the Board and to allow voting by proxy at Board meetings. These changes require approval by two-

thirds vote of the membership in order to be enacted. Please cast your vote on these amendments on the enclosed ballot.

Membership Renewal Time: A membership renewal form is enclosed with the ballot in this issue. Members with a 94 on their mailing label need to renew now to remain in good standing. (Members with a 95 are paid through this year).

Please note the new address for the Society in sending in your ballot/membership form.

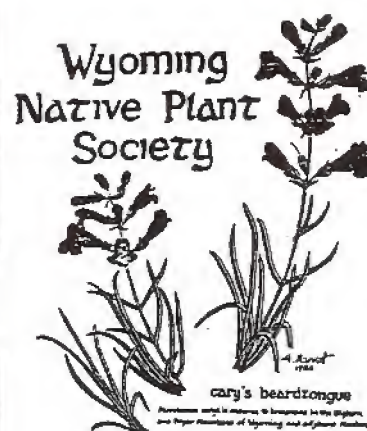
Teton Chapter News: Jim Ozenberger, ecologist on the Bridger-Teton National Forest is organizing a group to look for Sensitive and rare plants on the Forest this summer. Anyone interested in participating should contact Jim at Bridger-Teton NF (739-5500) or leaders of the Teton Chapter.

Adopt-A-Rare-Plant Program: Several members have agreed to adopt the Hyattville milkvetch, Laramie false sagebrush, and plants of the Red Canyon Preserve. If you are interested in adopting a plant of your own (see February newsletter for more details), contact Walt Fertig (745-5026).

New Members: Please welcome the following new members of WNPS: Frank Blomquist (Rawlins), Thomas & Claire Brooks (Saratoga), Mike Bynum (Riverton), Tim Chumley & Irene Thien (Laramie), Deborah Deslaurier (Jackson), Norman Hall (Columbus, OH), Lynn Kinter (Dubois), Judy Kowrach (Cheyenne), Steve Laster (Pinedale), Peggy Lyon (Laramie), Isobel Nichols (Laramie), Mary Rogers (Dubois), Sherry Shelley (Riverton), Judy Straw (Laramie), Rick Studenmund (Lander), Mrs. D. E. Wilbert (Riverton), Kim Wilbert (Riverton), Cherie Winner (Laramie).

Treasurer's Report: Balance as of 26 April, 1994: General Fund \$431.06; 1994-95 Scholarship Fund \$ 0.00. Total Funds: \$431.06.

Attention WNPS Members: Your articles about Wyoming native plants or art work are welcome in the newsletter! Deadline for the September issue is 1 September 1994.



Wyoming Native Plant Society

President: Phil White
Vice President: Barbara Amidon
Secretary/Treasurer: Walt Fertig
Board Members: George Jones
Jennifer Whipple
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Contributors to this issue: John Baxter, Jim Borland, Tim Clark, Carolyn Crawford, Jane Dorn, Robert Dorn, Walter Fertig (WF), Isobel Nichols, Judy von Ahlefeldt (JV).

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Spiranthes diluvialis (Ute Lady's Tresses)

Wyoming's First Listed Threatened Plant Species

By Walter Fertig

Wyoming now has its first federally listed Threatened plant under the Endangered Species Act, thanks to the efforts of Ernie Nelson, Manager of the Rocky Mountain Herbarium (RM).

Last August, Ernie was botanizing on a piece of state land in southwest Goshen County when he discovered a small population of lady's tresses orchids (genus *Spiranthes*). Ernie collected a voucher specimen for the herbarium, and moved on. Initially he thought it was *S. romanzoffiana*, a species more typical of mountainous areas, or possibly a Plains species new to Wyoming.

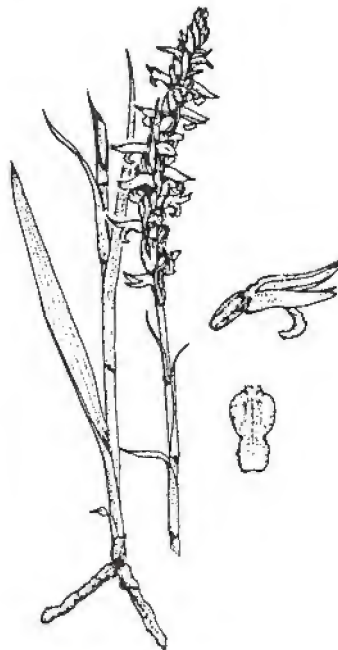
It was not until this spring that Ernie took another look at his specimen. "When I studied it closely, I realized it was odd for *Spiranthes romanzoffiana*" said Nelson. "I keyed it in the Flora of the Great Plains, thinking it might be a Plains species, but couldn't get it to fit. Someone suggested I look at *Spiranthes diluvialis*, and that's what it keyed out to." Other botanists, including Colorado orchid expert Bill Jennings, agreed with Ernie's determination.

Spiranthes diluvialis, commonly called Ute lady's tresses, was first described as a new species by Charles Sheviak in 1984. At that time, it was known from only a few scattered locations on the east slope in Colorado and in northern Utah and eastern Nevada. Several of these populations were suspected to be extirpated, while others were thought to be potentially vulnerable due to development of their habitat. Although additional populations were subsequently found in western Colorado and Utah (the single Nevada station is believed to be lost), the species was proposed for federal protection under the Endangered Species Act and was formally listed as Threatened in 1992.

Ute lady's tresses is a perennial herb with glandular-pubescent stems 8-14 inches tall (20-50 cm). Its inflorescence is a loose spike of numerous small, irregular, white flowers arranged in a gradual spiral. With some imagination, this inflorescence resembles the braids of a woman's hair, accounting for its common name. The lip

petal is oval to lance shaped, slightly narrowed near the middle, and has crispy-wavy margins.

Spiranthes diluvialis is morphologically intermediate between *S. romanzoffiana* and *S. magnicamporum*, a Great Plains species not known from Wyoming. *S. romanzoffiana* differs in having a more densely congested spike and deeply constricted lip petals. *S. magnicamporum* has strap-shaped lip petals with crisped-margins and lacks leaves at flowering time (*S. diluvialis* retains its leaves when flowering in late summer and early fall).



Ute Lady's Tresses. Illus. by Carolyn Crawford (reprinted from *Aquilegia*, the Newsletter of the Colorado Native Plant Society).

Cytological and genetic studies by Anna Arft, a graduate student at the University of Colorado, suggest that *S. diluvialis* evolved as a hybrid between these two species. Reproductive barriers maintain these three species as distinct today.

Ute lady's tresses is found on moist streambanks, wet meadows, and abandoned stream channels at elevations below 6000 feet. It is mostly found on sub-irrigated alluvial soils in full sun. Sheviak suggests

that this species was more widespread during wetter times in the last Pleistocene, but became restricted to scattered, locally moist areas as the climate became progressively drier.

Much of the habitat of *Spiranthes diluvialis* in Colorado and Utah has been altered by agricultural activity in the past century and a half. Recent studies, however, suggest that some of these activities may be potentially beneficial to the plant. According to Tamara Naumann, botanist with the city of Boulder, CO, winter and early spring grazing by cattle can stimulate *S. diluvialis* populations by creating open canopies and reducing competing vegetation, particularly aggressive alien weeds such as Canada thistle (*Cirsium arvense*). Haying and irrigating may also be beneficial for seed dispersal and in eliminating competing species. Ute lady's tresses probably evolved as an early successional species in riparian habitats and was maintained in the past by periodic flooding events or disturbances created by large ungulates.

Additional populations of *Spiranthes diluvialis* may occur on adjacent private farms and rangeland in southeast Wyoming, or possibly in suitable riparian habitat in southwest Wyoming (several populations are known in the Green River Basin south of the Wyoming border).

Legally, the Ute lady's tresses is now protected in Wyoming under the auspices of the Endangered Species Act. Protection for plants under the Act is limited almost entirely to federally managed lands. Populations on private lands are only protected from malicious harm by trespassers. Chuck Davis, field supervisor for the US Fish and Wildlife Service in Cheyenne does not expect the discovery of this plant to affect land uses in the area. "Federal agencies will have to consult with us before undertaking projects in the vicinity of the plant to help ensure that their actions don't harm the species" says Davis. "We may be interested in pursuing cooperative agreements with other agencies and individual landowners, but we otherwise don't expect landowners to be affected."

More information is needed to determine the biological and management requirements of *Spiranthes diluvialis* in Wyoming. With luck, good science-based management will ensure that our newest member of the flora of Wyoming will flourish in the state for many seasons to come.

The values attributed to endangered and rare species are diverse. Ehrenfeld (1976) condensed these into a list and noted that the following nine values can be assigned a monetary value and thus become commensurable with ordinary goods and services, although in some cases it would require a good deal of ingenuity to do so. They are: 1) recreational and aesthetic values, 2) undiscovered or undeveloped values, 3) ecosystem stability values, 4) examples of survival, 5) environmental baseline and monitoring values, 6) scientific values, 7) teaching values, 8) habitat reconstruction values, and 9) conservative values: avoidance of irreversible change. The specter of irreversibility is the most powerful reason for preserving these species.

We should be able to perceive that that which is irreplaceable is priceless. Let us use an endangered plant as an example. Laramie false sagebrush (*Sphaeromeria simplex*) was relocated in 1978, 71 years after the last collection on record. Certain chemical compounds which inhibit cell division have been isolated from another species in the same genus. The compounds are of interest in the search for drugs to treat cancer. Could this rare species have a cancer cure? We do not know, but the chances are much better than average. If we are lucky, it will survive long enough for someone to take a look. What other unknown compounds might it contain? We know we should look for a cancer cure, but we do not know what other compounds to look for because we have no hints like we do for the possible cancer compound.

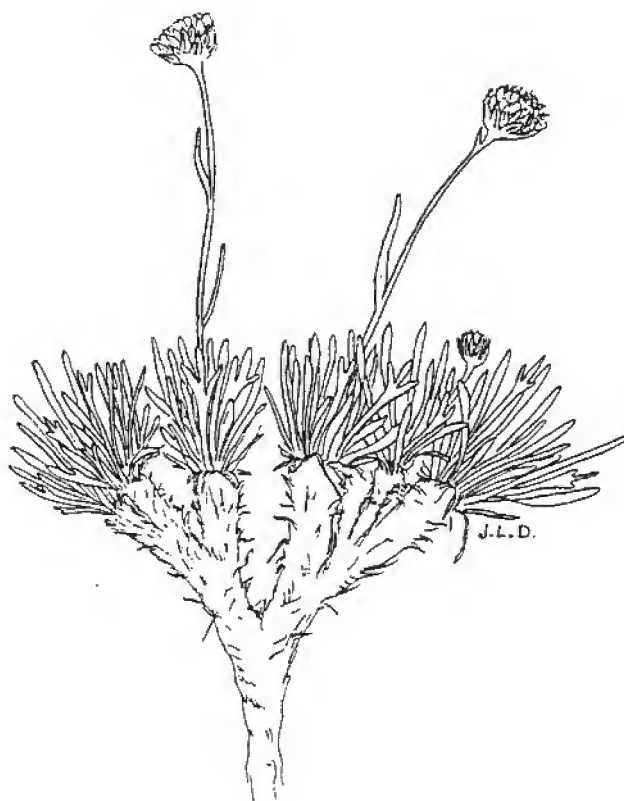
Evolution will continue without these species, but the processes of evolution, as we know them, will not put extinct species together again on this planet. The trend of evolution has been one of organisms evolving to exploit more and more hostile environments generally characteristic of extremes on environmental gradients. In both plants and animals there has been a trend toward more "independence" from the environment in the following sense. The mode of reproduction has evolved from external in the aquatic environment to completely or nearly completely internal. In flowering plants the gametophyte is no longer independent of the sporophyte. In placental mammals the embryo develops completely in the body of the mother and

there is postnatal care by at least one adult. This internalization in both plants and animals is more than parallel evolution in the usual sense. It is determinate evolution, a logical sequence to fill previously unoccupied environments. In a similar fashion the problem of coping with a cold or extremely dry season has been solved by specialized adaptations including dormancy in plants and homeostasis or hibernation in animals. These are obvious adaptations. How many subtle ones exist that we do not yet recognize, we cannot even guess.

As the human population puts more and more pressure on existing environments and looks for ways to expand into more hostile ones, the very key to learning how to utilize these rigorous environments in ways productive to ourselves may be destroyed through extinctions. In some of these rare species may be our answers to

arid-land farming, cold-climate farming, efficient energy utilization, and many other challenges.

One aspect which the endangered species programs seldom emphasize is the fact that various species are endangered for different reasons. It is perfectly natural that less efficient organisms will be replaced by more efficient ones through extinction. Some species are evolutionarily old and were well on their way to extinction without man's help. It is difficult to justify giving these high priority and special consideration, especially if substantial cost is involved. On the other hand, recently evolved species are usually colonizing a hostile habitat or one previously unoccupied. The greatest potential values are in this group. These deserve top priority in situations where our resources are limited. Many endangered species have not been



Above: Laramie false sagebrush (*Sphaeromeria simplex*), a plant that may possess chemical compounds useful for treating cancer. This species is known from less than 5 sites worldwide, all in southeastern Wyoming. Ill. by Jane Dorn.

studied because of their rarity, so it may be quite some time before their evolutionary age can be determined.

It has been repeatedly pointed out that the biggest single cause of extinctions in modern times is destruction of habitats. We must protect the habitats if we hope to protect the species! This is a land management problem. It seems rather strange that a Christian nation has such a poor record in its stewardship of the land. Aldo Leopold (1966), in reflecting on the evolution of ethics, commented that "obligations have no meaning without conscience, and the problem we face is the extension of the social conscience from people to land." It should be obvious to anyone giving it half a thought that future generations will be dependent on the land we pass on to them. This is the ultimate resource (except for the

sun) for supporting all life including people. Have we been good stewards of this land? In most cases we have not, since short-term economics is still the primary factor determining what is done with man's relation to land.

Our goal is clear. We need an "ethic dealing with man's relation to land and to the animals and plants which grow upon it" (Leopold 1966). It remains to be seen whether we will be able to achieve this goal in time to save the essential "cogs and wheels" which keep the biosphere running smoothly. In Wyoming we have relatively few species to protect. Hopefully we can fulfill our obligations to future generations.

References:

- Eckholm, E. 1978. Disappearing species: the social challenge. Worldwatch Institute, Washington DC.
 Ehrenfeld, D. W. 1976. The conservation of non-resources. *Amer. Scientist* 64: 648-656.
 Hutchinson, G. E. 1978. An introduction to population dynamics. *Aria da Capo and Quodlibet*. Yale Univ. Press, New Haven, CT.
 Leopold, A. 1966. *A Sand County Almanac* with other essays on conservation from the Round River. Oxford Univ. Press, NY.

Reprinted from "Rare and Endangered Vascular Plants and Vertebrates of Wyoming" edited by Tim Clark and Robert Dorn, 1981.



Left: Contracted Indian ricegrass (*Oryzopsis contracta*) is a regional endemic of the basin country of Wyoming, Montana, and Colorado. It is closely related to Indian ricegrass (*Oryzopsis hymenoides*), a species that is considered one of the most valuable native forage species for wildlife and livestock. Because it is adapted to cold, dry environments and tolerates disturbance, Contracted Indian ricegrass has excellent potential for greater use in abandoned land recovery, roadside planting, and range improvement. Ill. by Isobel Nichols.

The Botany 130 Song Book

By John "Barney" Baxter

At the University of Wisconsin-Milwaukee each member of the botany department was assigned a certain number of laboratory sections in Botany 130, the introductory botany course. The following songs describe some of the trials and tribulations in the life of a Botany 130 lab instructor.

Potometer

(Tune: Oh Tannenbaum)

Potometer,
 Potometer,
 Oh source of much frustration,
 So widely used in botany labs
 To measure transpiration,
 Oh gadget that so rarely works,
 Who can predict your crazy quirks?
 You make instructors get the jerks
 And nervous perspiration.

Potometer,
 Potometer,
 Why have you ceased to function?
 Perhaps a stopcock open wide
 At some important junction,
 Our bubble trouble's getting worse,
 Just hear our lab instructor curse,
 I think he's going to need a nurse
 Or even extreme unction.

Three-Year-Old Basswood

(Tune: Winchester Cathedral)

Oh 3-year-old basswood
 You're breaking me down,
 The students are laughing,
 I feel like a clown,
 They asked me a question,
 I had no reply,
 I feel so embarrassed,
 I'm ready to cry.

I should have boned up before coming
 into this class,
 If I took a test on this stuff I don't
 think that I'd be able to pass.

I'll get a hatchet,
 And all through the town,
 When I see a basswood
 I'll chop it right down.
 Oh no de oh do,
 I hate em all so,
 Those *Tilia* trees
 have to go

HORTICULTURAL NOTES

Golden Currant (*Ribes aureum*)

By Jim Borland

(Reprinted from *Aquilegia*,
the Newsletter of the Colorado Native Plant Society)

Although the scientific community seems perplexed about whether to assign all *Ribes* to the Saxifrage (Saxifragaceae) or to the gooseberry family (Grossulariaceae), the horticultural community continues to use them for both aesthetic value and food.

Ribes aureum has many common names, all of which describe some favorable features of the species. These include the golden currant, buffalo currant, Missouri currant, flowering currant, fragrant currant, and slender golden currant, as well as clove bush.

Native to a large portion of the western U.S., golden currant can be found growing with many other native shrubs and trees from the Plains into the Rocky Mountains (zone 2). Although this shrub is more common to creek and riverside habitats, it has

proved adaptable to drier sites and poorer soils.

Generally, golden currant's native soil is coarse to medium in texture, shallow or deep, well-drained and fertile with a pH of 6.5 to 7.0. Nursery container soils and garden soils that are either more acidic or alkaline generally result in excellent growth as well.

In May, golden currant produces many racemes of 3/4-1 inch long yellow, tubular flowers that are usually tipped with red and emit a wonderful clove or spicy odor. These flowers are coupled with bright green, 2 inch wide leaves attractively displayed on a 3 to 9 foot tall upright, branching, spineless shrub. The leaves' shape resembles that of gooseberry leaves.

Golden currant's fruits are unusually large for a wild currant (up to 1/2 inch in diameter) and are either red, yellow, or black. These edible berries are excellent for people and animals.

While this shrub tolerates some shade, its growth is more compact and it produces more flowers in full sun. Furthermore, its foliage turns to burnished yellows, reds, and oranges in sunny locations in fall.

Golden currant propagates itself through underground root suckers, which indicates that additional plants can be propagated by division or by planting root pieces. Softwood and hardwood cuttings taken nearly any time of the year will also root through mist propagation or in outdoor beds. In the nursery, this plant can be propagated by exposing the seeds to moist, cold (41 degrees F.) conditions for 60 to 90 days and then germinating them at 70 degrees F. A germination rate of 60 to 90 % can be expected from sound seed. Golden currant grows rapidly both in the nursery and landscape.

Due to its affinity to moist habitats, it is difficult to assign a definitive moisture requirement for this species. However, 15 to 20 inches of annual precipitation should ensure good growth. In full sun, additional moisture usually results in a larger, faster-growing shrub that does not become unruly or top-heavy. If pruning becomes necessary, periodically remove the canes entirely to the plant's base.

Although I have noted aphid infestations (among other gooseberry maladies) on golden currant, serious consequences are uncommon in the wild.



Saussurea weberi (Ill. by W. Fertig)

What's in a Name?

With this issue, we begin a new series highlighting once famous but now little-known individuals immortalized in plant genus and species names.

Saussurea weberi (Weber's Saw-wort)

The genus *Saussurea* in the Asteraceae (sunflower family) contains approximately 300 species, most of which are confined to Eurasia. *Saussurea* is closely related to the thistles, but differs in lacking spiny leaves and stems. Several Asian species are grown as ornamentals, and one particularly odoriferous species (*S. lappa*) is used for medicines and scents.

De Candolle named the genus in honor of Swiss naturalist Horace de Saussure and his son, Theodore. Theodore Saussure (1767-1845) was one of the leading plant physiologists of his era and his elegantly designed experiments resulted in the discovery of many principles of photosynthesis and mineral nutrition. In his book "Chemical Researches on Vegetation"

Saussure proved that increases in the dry weight of plants came from Carbon derived from atmospheric Carbon dioxide and water from the ground. Plants showed an increase in Carbon only when they were exposed to light. He also showed that plants required minerals for growth (particularly Nitrogen) and that these minerals were derived from the soil rather than the air.

Saussure never saw one of his namesakes, *Saussurea weberi*, a regional endemic of the Rocky Mountains first described by Hulten in 1959. Weber's saw-wort occurs on alpine limestone talus and rocky grasslands. It has an unusual distribution pattern, being found in only three isolated areas in the Rockies in southwestern Montana, Wyoming's Wind River Range, and central Colorado. Due to its limited distribution and abundance, the species is designated as Sensitive by the US Forest Service.

The specific epithet of *Saussurea weberi* honors Dr. William Weber, longtime dean of Colorado botany and author of several popular floras of the Rockies and Colorado. WF

Summer Field Trips

Explore the Ashenfelder Basin
Saturday, June 18, 1994

The Ashenfelder Basin consists of several deep canyons on the northeast side of Laramie Peak. Elevations range from about 6000 feet near the Medicine Bow National Forest boundary, to 10,200 feet at the summit of Laramie Peak. The entire basin is forested, with lodgepole pine and subalpine fir at higher elevations and ponderosa pine at lower elevations. Engelmann spruce can be found along streams at mid-eleva-

tions.

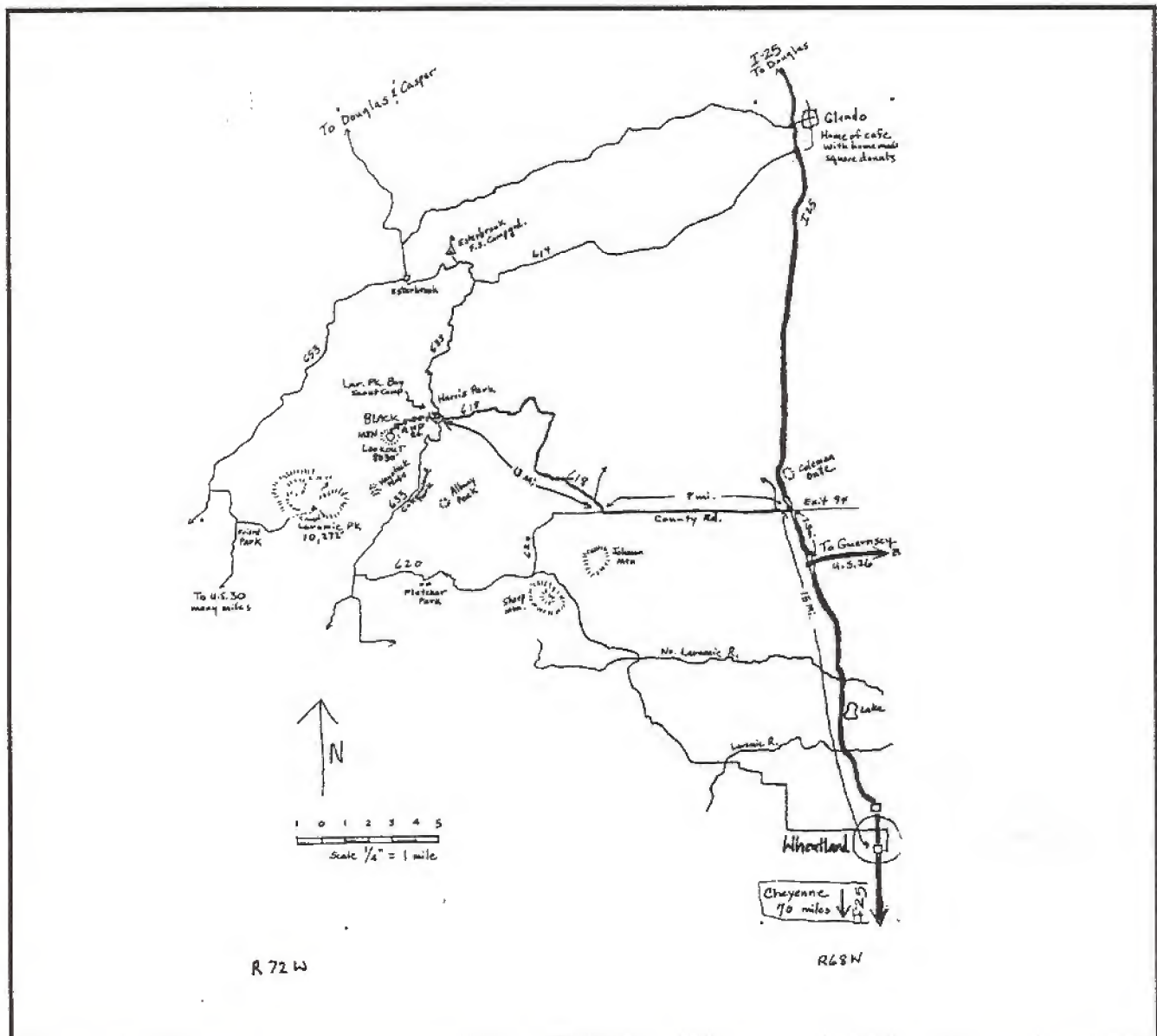
Aven Nelson collected plants in the basin at least twice in the late 1800s. The endemic Laramie columbine (*Aquilegia laramiensis*) is known from the basin and other unusual species have been documented here. These include *Pyrola picta*, *Carex tenera*, and *Asplenium septentrionale*.

The area is best known for its virgin stands of ponderosa pine, with some individuals 400 years old. Between 1988 and 1992 a severe infestation of pine beetles has killed many trees of all age classes.

The Ashenfelder Basin has been proposed as a Research Natural Area and the Environmental Assessment is currently

under revision on the Douglas Ranger District. The flora of the Basin is only partially known, and it is hoped that our field trip will add new species to the list being compiled for the area by the Forest Service.

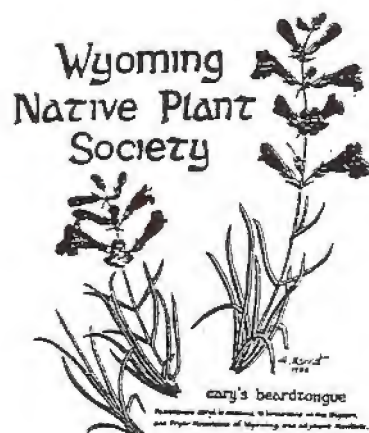
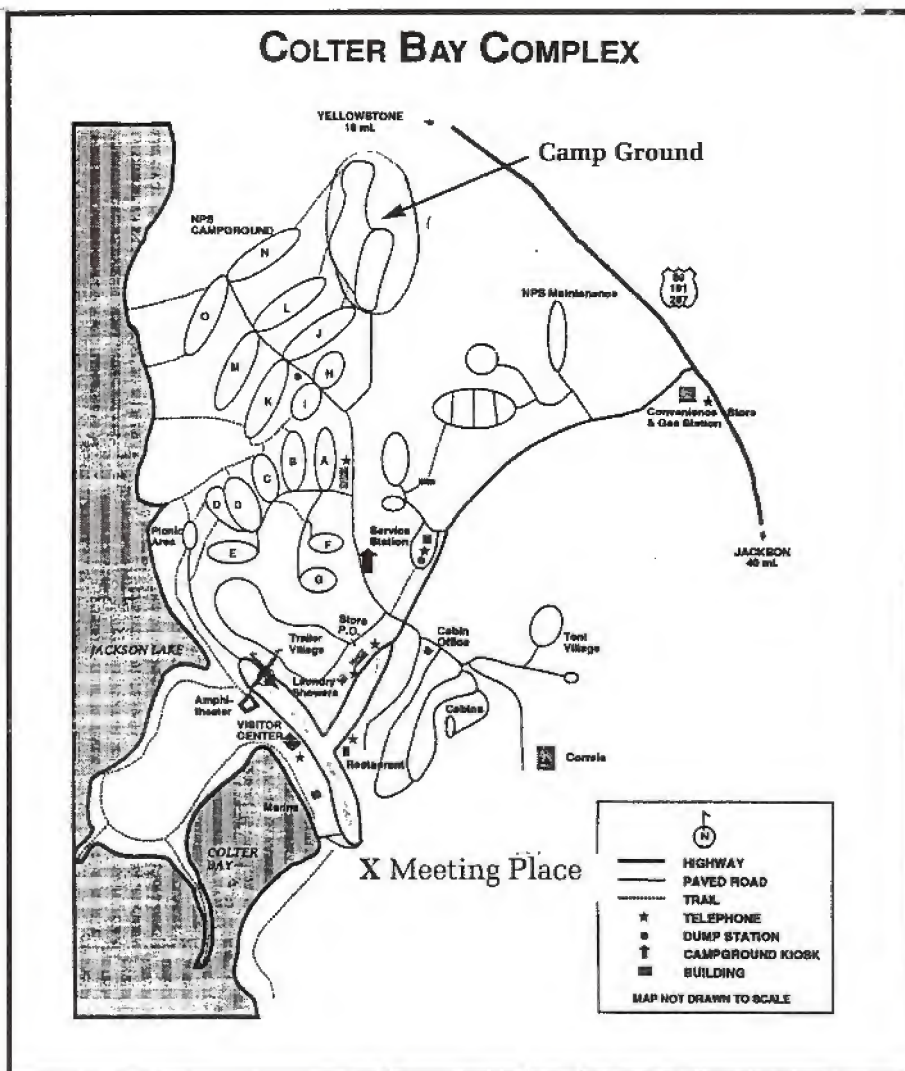
The field trip will involve about 6-8 miles of hiking at 6000-7000 feet elevation with some moderate hills on good trails. Be sure to pack a lunch and bring water. Meet at the Harris Park Boy Scout Camp at 8:30 AM. Take the El Rancho Road exit (exit # 94) off I-25 north of Wheatland. Take the County road to the west (not the El Rancho Rd) and follow the signs to the Boy Scout Camp. Where there are choices, take right turns. JV



Annual Meeting/Field Trip Grand Teton National Park July 9-10, 1994

The Society's annual meeting and field trip will be held in Grand Teton National Park this summer. Plan to meet Saturday, July 9, at 9:00 AM at the Colter Bay Visitor Center parking lot (see map). A brief (?) business meeting will be held in the parking area at which time the Saturday field trip itinerary will be decided. More than one hike may be scheduled depending on the number and interests of the attendees. On Sunday, a trip is planned on the ski tram to visit alpine areas at the summit of the range. Participants may chose to take the tram back or hike down from the summit.

WNPS has reserved a group camp site for the weekend at Colter Bay. Cost will be \$2 per person for the campsite. Additional camping is available elsewhere in the park and in the adjacent National Forests. Unfortunately, the Society was unable to receive a fee-waiver for entrance to the Park. Costs are \$10 per vehicle, but passes are good for at least a week. As of late April, it appears we will receive an educational discount for the alpine tram. Cost for the tram is \$5 per person. We regret that this year's meeting will be more costly than those in the past, but we hope many of you will still find it worthwhile to enjoy the spectacular scenery of the Tetons in the company of fellow plant lovers. WF



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